SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

WA 2917
10-12-92
84

Report To: Burlington Environmental Engineering

Date: October 12, 1992

Report On: Analysis of Soil

Lab No.: 27267

IDENTIFICATION:
Samples Received on 09-22-92
Project: 624878 Pier 91

ANALYSIS:

Lab No. 27267-1 Client ID: CP-HA6-4.5-5

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 9-25-92
Date Analyzed: 10-5-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
108-95-2	Phenol	ND	14,000	
111-44-4	bis(2-Chloroethyl) ether	ND	14,000	
95-57-8	2-Chlorophenol	ND	14,000	
541-73-1	1,3-Dichlorobenzene	ND	14,000	
106-46-7	1,4-Dichlorobenzene	ND	14,000	
100-51-6	Benzyl Alcohol	ND	27,000	
95-50-1	1,2-Dichlorobenzene	ND	14,000	
95-48-7	2-Methylphenol	ND	14,000	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	14,000	
106-44-5	4-Methylphenol	ND	14,000	
621-64-7	N-Nitroso-Di-N-propylamine	ND	14,000	
67-72-1	Hexachloroethane	ND	14,000	
98-95-3	Nitrobenzene	ND	14,000	
78-59-1	Isophorone	ND	14,000	
88-75-5	2-Nitrophenol	ND	14,000	
105-67-9	2,4-Dimethylphenol	ND	14,000	
65-85-0	Benzoic Acid	ND	68,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	14,000	
120-83-2	2,4-Dichlorophenol	ND	14,000	
120-82-1	1,2,4-Trichlorobenzene	ND	14,000	
91-20-3	Naphthalene	12,000	14,000	J
106-47-8	4-Chloroaniline	ND	27,000	
87-68-3	Hexachlorobutadiene	ND	14,000	
59-50-7	4-Chloro-3-methylphenol	ND	27,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-1 Client ID: CP-HA6-4.5-5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
91-57-6	2-Methylnaphthalene	31,000	14,000	
77-47-4	Hexachlorocyclopentadiene	ND	14,000	
88-06-2	2,4,6-Trichlorophenol	ND	14,000	
95-95-4	2,4,5-Trichlorophenol	ND	14,000	
91-58-7	2-Chloronaphthalene	ND	14,000	
88-74-4	2-Nitroaniline	ND	68,000	
131-11-3	Dimethyl phthalate	ND	14,000	
208-96-8	Acenaphthylene	ND	14,000	
606-20-2	2,6-Dinitrotoluene	ND	14,000	
99-09-2	3-Nitroaniline	ND	68,000	
83-32-9	Acenaphthene	1,500	14,000	J
51-28-5	2,4-Dinitrophenol	ND	68,000	
100-02-7	4-Nitrophenol	ND	68,000	
132-64-9	Dibenzofuran	ND	14,000	
121-14-2	2,4-Dinitrotoluene	ND	14,000	
84-66-2	Diethylphthalate	ND	14,000	
7005-72-3	4-Chlorophenyl phenyl ether	ND	14,000	
86-73-7	Fluorene	3,200	14,000	J
100-01-6	4-Nitroaniline	ND	68,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	68,000	
86-30-6	N-Nitrosodiphenylamine	ND	14,000	
101-55-3	4-Bromophenyl phenyl ether	ND	14,000	
118-74-1	Hexachlorobenzene	ND	14,000	
87-86-5	Pentachlorophenol	ND	68,000	
85-01-8	Phenanthrene	5,900	14,000	J
120-12-7	Anthracene	ND	14,000	
84-74-2	Di-n-butylphthalate	ND	14,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-1 Client ID: CP-HA6-4.5-5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL
206-44-0	Fluoranthene	ND	14,000
129-00-0	Pyrene	ND	14,000
85-68-7	Butyl benzyl phthalate	ND	14,000
91-94-1	3,3'-Dichlorobenzidine	ND	27,000
56-55-3	Benzo(a)anthracene	ND	14,000
218-01-9	Chrysene	ND	14,000
117-81-7	bis(2-ethylhexyl)phthalate	ND	14,000
117-84-0	Di-n-octyl phthalate	ND	14,000
205-99-2	Benzo(b)fluoranthene	ND	14,000
207-08-9	Benzo(k)fluoranthene	ND	14,000
50-32-8	Benzo(a)pyrene	ND	14,000
193-39-5	Indeno(1,2,3-cd)pyrene	ND	14,000
53-70-3	Dibenz(a,h)anthracene	ND	14,000
191-24-2	Benzo(g,h,i)perylene	ND	14,000

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d_{14}	X8	33 - 141	18 - 137
Phenol-d_6	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-1 Client ID: CP-HA6-4.5-5

TPH Per EPA Method 418.1
Date Extracted: 9-23-92
Date Analyzed: 9-24-92

Total Petroleum Hydrocarbons, mg/kg	19,000

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 9-24-92
Date Analyzed: 9-30-92

Total Petroleum Fuel Hydrocarbons, mg/kg	22,000	X2

TPH as Aged Gasoline/Diesel/Heavy Oil

SURROGATE RECOVERY, %	
1-chlorooctane	X8
1-terphenyl	X8

Heavy Oil concentration is estimated using diesel curve.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-2 Client ID: CP-HA6-6-6.5

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 9-25-92
Date Analyzed: 10-5-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
108-95-2	Phenol	ND	15,000	
111-44-4	bis(2-Chloroethyl) ether	ND	15,000	
95-57-8	2-Chlorophenol	ND	15,000	
541-73-1	1,3-Dichlorobenzene	ND	15,000	
106-46-7	1,4-Dichlorobenzene	ND	15,000	
100-51-6	Benzyl Alcohol	ND	29,000	
95-50-1	1,2-Dichlorobenzene	ND	15,000	
95-48-7	2-Methylphenol	ND	15,000	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	15,000	
106-44-5	4-Methylphenol	ND	15,000	
621-64-7	N-Nitroso-Di-N-propylamine	ND	15,000	
67-72-1	Hexachloroethane	ND	15,000	
98-95-3	Nitrobenzene	ND	15,000	
78-59-1	Isophorone	ND	15,000	
88-75-5	2-Nitrophenol	ND	15,000	
105-67-9	2,4-Dimethylphenol	ND	15,000	
65-85-0	Benzoic Acid	ND	73,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	15,000	
120-83-2	2,4-Dichlorophenol	ND	15,000	
120-82-1	1,2,4-Trichlorobenzene	ND	15,000	
91-20-3	Naphthalene	7,800	15,000	J
106-47-8	4-Chloroaniline	ND	29,000	
87-68-3	Hexachlorobutadiene	ND	15,000	
59-50-7	4-Chloro-3-methylphenol	ND	29,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-2 Client ID: CP-HA6-6-6.5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
91-57-6	2-Methylnaphthalene	21,000	15,000	
77-47-4	Hexachlorocyclopentadiene	ND	15,000	
88-06-2	2,4,6-Trichlorophenol	ND	15,000	
95-95-4	2,4,5-Trichlorophenol	ND	15,000	
91-58-7	2-Chloronaphthalene	ND	15,000	
88-74-4	2-Nitroaniline	ND	73,000	
131-11-3	Dimethyl phthalate	ND	15,000	
208-96-8	Acenaphthylene	ND	15,000	
606-20-2	2,6-Dinitrotoluene	ND	15,000	
99-09-2	3-Nitroaniline	ND	73,000	
83-32-9	Acenaphthene	ND	15,000	
51-28-5	2,4-Dinitrophenol	ND	73,000	
100-02-7	4-Nitrophenol	ND	73,000	
132-64-9	Dibenzofuran	ND	15,000	
121-14-2	2,4-Dinitrotoluene	ND	15,000	
84-66-2	Diethylphthalate	ND	15,000	
7005-72-3	4-Chlorophenyl phenyl ether	ND	15,000	
86-73-7	Fluorene	ND	15,000	
100-01-6	4-Nitroaniline	ND	73,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	73,000	
86-30-6	N-Nitrosodiphenylamine	ND	15,000	
101-55-3	4-Bromophenyl phenyl ether	ND	15,000	
118-74-1	Hexachlorobenzene	ND	15,000	
87-86-5	Pentachlorophenol	ND	73,000	
85-01-8	Phenanthrene	4,600	15,000	J
120-12-7	Anthracene	ND	15,000	
84-74-2	Di-n-butylphthalate	ND	15,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-2 Client ID: CP-HA6-6-6.5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL
206-44-0	Fluoranthene	ND	15,000
129-00-0	Pyrene	ND	15,000
85-68-7	Butyl benzyl phthalate	ND	15,000
91-94-1	3,3'-Dichlorobenzidine	ND	29,000
56-55-3	Benzo(a)anthracene	ND	15,000
218-01-9	Chrysene	ND	15,000
117-81-7	bis(2-ethylhexyl)phthalate	ND	15,000
117-84-0	Di-n-octyl phthalate	ND	15,000
205-99-2	Benzo(b)fluoranthene	ND	15,000
207-08-9	Benzo(k)fluoranthene	ND	15,000
50-32-8	Benzo(a)pyrene	ND	15,000
193-39-5	Indeno(1,2,3-cd)pyrene	ND	15,000
53-70-3	Dibenz(a,h)anthracene	ND	15,000
191-24-2	Benzo(g,h,i)perylene	ND	15,000

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d_{14}	X8	33 - 141	18 - 137
Phenol-d_6	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-2 Client ID: CP-HA6-6-6.5

TPH Per EPA Method 418.1
Date Extracted: 9-23-92
Date Analyzed: 9-24-92

Total Petroleum Hydrocarbons, mg/kg	5,600	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 9-24-92
Date Analyzed: 10-1-92

Total Petroleum Fuel Hydrocarbons, mg/kg	13,000	X2	E

TPH as Aged Gasoline/Diesel/Heavy Oil

SURROGATE RECOVERY, %		
1-chlorooctane	214	X10
1-terphenyl	246	X10

Heavy Oil concentration is estimated using diesel curve.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-3 Client ID: CP-HA3-4.5-5

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 9-25-92
Date Analyzed: 10-5-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
108-95-2	Phenol	ND	4,000	
111-44-4	bis(2-Chloroethyl) ether	ND	4,000	
95-57-8	2-Chlorophenol	ND	4,000	
541-73-1	1,3-Dichlorobenzene	ND	4,000	
106-46-7	1,4-Dichlorobenzene	ND	4,000	
100-51-6	Benzyl Alcohol	ND	8,000	
95-50-1	1,2-Dichlorobenzene	ND	4,000	
95-48-7	2-Methylphenol	ND	4,000	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	4,000	
106-44-5	4-Methylphenol	ND	4,000	
621-64-7	N-Nitroso-Di-N-propylamine	ND	4,000	
67-72-1	Hexachloroethane	ND	4,000	
98-95-3	Nitrobenzene	ND	4,000	
78-59-1	Isophorone	ND	4,000	
88-75-5	2-Nitrophenol	ND	4,000	
105-67-9	2,4-Dimethylphenol	ND	4,000	
65-85-0	Benzoic Acid	ND	20,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	4,000	
120-83-2	2,4-Dichlorophenol	ND	4,000	
120-82-1	1,2,4-Trichlorobenzene	1,600	4,000	J
91-20-3	Naphthalene	2,700	4,000	J
106-47-8	4-Chloroaniline	ND	8,000	
87-68-3	Hexachlorobutadiene	ND	4,000	
59-50-7	4-Chloro-3-methylphenol	ND	8,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-3 Client ID: CP-HA3-4.5-5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
91-57-6	2-Methylnaphthalene	ND	4,000	
77-47-4	Hexachlorocyclopentadiene	ND	4,000	
88-06-2	2,4,6-Trichlorophenol	ND	4,000	
95-95-4	2,4,5-Trichlorophenol	ND	4,000	
91-58-7	2-Chloronaphthalene	ND	4,000	
88-74-4	2-Nitroaniline	ND	20,000	
131-11-3	Dimethyl phthalate	ND	4,000	
208-96-8	Acenaphthylene	ND	4,000	
606-20-2	2,6-Dinitrotoluene	ND	4,000	
99-09-2	3-Nitroaniline	ND	20,000	
83-32-9	Acenaphthene	ND	4,000	
51-28-5	2,4-Dinitrophenol	ND	20,000	
100-02-7	4-Nitrophenol	ND	20,000	
132-64-9	Dibenzofuran	ND	4,000	
121-14-2	2,4-Dinitrotoluene	ND	4,000	
84-66-2	Diethylphthalate	ND	4,000	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4,000	
86-73-7	Fluorene	750	4,000	J
100-01-6	4-Nitroaniline	ND	20,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	20,000	
86-30-6	N-Nitrosodiphenylamine	ND	4,000	
101-55-3	4-Bromophenyl phenyl ether	ND	4,000	
118-74-1	Hexachlorobenzene	ND	4,000	
87-86-5	Pentachlorophenol	ND	20,000	
85-01-8	Phenanthrene	1,300	4,000	J
120-12-7	Anthracene	ND	4,000	
84-74-2	Di-n-butylphthalate	ND	4,000	

ND - Not Detected

Continued . . . . .

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-3 Client ID: CP-HA3-4.5-5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL
206-44-0	Fluoranthene	ND	4,000
129-00-0	Pyrene	ND	4,000
85-68-7	Butyl benzyl phthalate	ND	4,000
91-94-1	3,3'-Dichlorobenzidine	ND	8,000
56-55-3	Benzo(a)anthracene	ND	4,000
218-01-9	Chrysene	ND	4,000
117-81-7	bis(2-ethylhexyl)phthalate	ND	4,000
117-84-0	Di-n-octyl phthalate	ND	4,000
205-99-2	Benzo(b)fluoranthene	ND	4,000
207-08-9	Benzo(k)fluoranthene	ND	4,000
50-32-8	Benzo(a)pyrene	ND	4,000
193-39-5	Indeno(1,2,3-cd)pyrene	ND	4,000
53-70-3	Dibenz(a,h)anthracene	ND	4,000
191-24-2	Benzo(g,h,i)perylene	ND	4,000

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d_{14}	X8	33 - 141	18 - 137
Phenol-d_6	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-3 Client ID: CP-HA3-4.5-5

TPH Per EPA Method 418.1
Date Extracted: 9-23-92
Date Analyzed: 9-24-92

Total Petroleum Hydrocarbons, mg/kg	9,200

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 9-24-92
Date Analyzed: 10-1-92

Total Petroleum Fuel Hydrocarbons, mg/kg	19,000	X2

TPH as Aged Gasoline/Diesel/Heavy Oil

SURROGATE RECOVERY, %	
1-chlorooctane	X8
1-terphenyl	X8

Heavy Oil concentration is estimated using diesel curve.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-4 Client ID: CP-HA3-6-6.5

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 9-25-92
Date Analyzed: 10-5-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
108-95-2	Phenol	ND	35,000	
111-44-4	bis(2-Chloroethyl) ether	ND	35,000	
95-57-8	2-Chlorophenol	ND	35,000	
541-73-1	1,3-Dichlorobenzene	ND	35,000	
106-46-7	1,4-Dichlorobenzene	ND	35,000	
100-51-6	Benzyl Alcohol	ND	70,000	
95-50-1	1,2-Dichlorobenzene	ND	35,000	
95-48-7	2-Methylphenol	ND	35,000	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	35,000	
106-44-5	4-Methylphenol	ND	35,000	
621-64-7	N-Nitroso-Di-N-propylamine	ND	35,000	
67-72-1	Hexachloroethane	ND	35,000	
98-95-3	Nitrobenzene	ND	35,000	
78-59-1	Isophorone	ND	35,000	
88-75-5	2-Nitrophenol	ND	35,000	
105-67-9	2,4-Dimethylphenol	ND	35,000	
65-85-0	Benzoic Acid	ND	170,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	35,000	
120-83-2	2,4-Dichlorophenol	ND	35,000	
120-82-1	1,2,4-Trichlorobenzene	33,000	35,000	J
91-20-3	Naphthalene	36,000	35,000	
106-47-8	4-Chloroaniline	ND	70,000	
87-68-3	Hexachlorobutadiene	ND	35,000	
59-50-7	4-Chloro-3-methylphenol	ND	70,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-4 Client ID: CP-HA3-6-6.5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
91-57-6	2-Methylnaphthalene	43,000	35,000	
77-47-4	Hexachlorocyclopentadiene	ND	35,000	
88-06-2	2,4,6-Trichlorophenol	ND	35,000	
95-95-4	2,4,5-Trichlorophenol	ND	35,000	
91-58-7	2-Chloronaphthalene	ND	35,000	
88-74-4	2-Nitroaniline	ND	170,000	
131-11-3	Dimethyl phthalate	ND	35,000	
208-96-8	Acenaphthylene	ND	35,000	
606-20-2	2,6-Dinitrotoluene	ND	35,000	
99-09-2	3-Nitroaniline	ND	170,000	
83-32-9	Acenaphthene	5,200	35,000	J
51-28-5	2,4-Dinitrophenol	ND	170,000	
100-02-7	4-Nitrophenol	ND	170,000	
132-64-9	Dibenzofuran	ND	35,000	
121-14-2	2,4-Dinitrotoluene	ND	35,000	
84-66-2	Diethylphthalate	ND	35,000	
7005-72-3	4-Chlorophenyl phenyl ether	ND	35,000	
86-73-7	Fluorene	10,000	35,000	J
100-01-6	4-Nitroaniline	ND	170,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	170,000	
86-30-6	N-Nitrosodiphenylamine	ND	35,000	
101-55-3	4-Bromophenyl phenyl ether	ND	35,000	
118-74-1	Hexachlorobenzene	ND	35,000	
87-86-5	Pentachlorophenol	ND	170,000	
85-01-8	Phenanthrene	32,000	35,000	J
120-12-7	Anthracene	ND	35,000	
84-74-2	Di-n-butylphthalate	ND	35,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-4 Client ID: CP-HA3-6-6.5

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flags
206-44-0	Fluoranthene	ND	35,000	
129-00-0	Pyrene	16,000	35,000	J
85-68-7	Butyl benzyl phthalate	ND	35,000	
91-94-1	3,3'-Dichlorobenzidine	ND	70,000	
56-55-3	Benzo(a)anthracene	ND	35,000	
218-01-9	Chrysene	ND	35,000	
117-81-7	bis(2-ethylhexyl)phthalate	ND	35,000	
117-84-0	Di-n-octyl phthalate	ND	35,000	
205-99-2	Benzo(b)fluoranthene	ND	35,000	
207-08-9	Benzo(k)fluoranthene	ND	35,000	
50-32-8	Benzo(a)pyrene	ND	35,000	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	35,000	
53-70-3	Dibenz(a,h)anthracene	ND	35,000	
191-24-2	Benzo(g,h,i)perylene	ND	35,000	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d_{14}	X8	33 - 141	18 - 137
Phenol-d_6	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27267
October 12, 1992

Lab No. 27267-4 Client ID: CP-HA3-6-6.5

TPH Per EPA Method 418.1
Date Extracted: 9-23-92
Date Analyzed: 9-24-92

Total Petroleum Hydrocarbons, mg/kg	29,000

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 9-24-92
Date Analyzed: 10-1-92

Total Petroleum Fuel Hydrocarbons, mg/kg	34,000	X2 E

TPH as Aged Gasoline/Diesel/Heavy Oil

SURROGATE RECOVERY, %	
1-chlorooctane	X8
1-terphenyl	X8

Heavy Oil concentration is estimated using diesel curve.

SOUND ANALYTICAL SERVICES

DENNIS L. BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental Enigneering
Lab No: 27267qc1
Matrix: Soil
Units: mg/kg
Date: October 12, 1992

DUPLICATE

Dup No. 27267-1

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Hydrocarbons	19,000	23,000	14.6

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 27267-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD	Flags
Total Petroleum Hydrocarbons	19,000	19,000	200	Lost	21,000	10.0	X5

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons by Method 8015

Client: Burlington Environmental Engineering
Lab No: 27267qc2
Matrix: Soil
Units: mg/kg
Date: October 12, 1992

DUPLICATE

Dup. No. 27267-1

Parameter	Sample(S)	Duplicate(D)	RPD	FLAG
Total Petroleum Fuel Hydrocarbons	22,000	21,000	4.7	X2
SURROGATE RECOVERY%				
1-chlorooctane				X8
o-terphenyl	N/C	N/C		X8

N/C - Not Calculated
RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 27267-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	MS %R	Spike Dup Result (MSD)	RPD	FLAGS
Total Petroleum Fuel Hydrocarbons	22,000	27,000	405	1,233	24,000	11.8	X5

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons by Method 8015

Client: Burlington Environmental Engineering
Lab No: 27267qc2
Matrix: Soil
Units: mg/kg
Date: October 12, 1992

METHOD BLANK

Blank No. 016R0301.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 10
SURROGATE RECOVERY%	
1-chlorooctane	97
o-terphenyl	118

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental Engineering
Lab No: 27267qc3
Units: ug/kg
Date: October 12, 1992
Blank No: S6287

METHOD BLANK

Compound	Blank Value	PQL	Flags
Phenol	ND	670	
bis(2-Chloroethyl) ether	ND	670	
2-Chlorophenol	ND	670	
1,3-Dichlorobenzene	ND	670	
1,4-Dichlorobenzene	ND	670	
Benzyl Alcohol	ND	1,300	
1,2-Dichlorobenzene	ND	670	
2-Methylphenol	ND	670	
bis(2-Chloroisopropyl)ether	ND	670	
4-Methylphenol	ND	670	
N-Nitroso-Di-N-propylamine	ND	670	
Hexachloroethane	ND	670	
Nitrobenzene	ND	670	
Isophorone	ND	670	
2-Nitrophenol	ND	670	
2,4-Dimethylphenol	ND	670	
Benzoic Acid	ND	3,300	
bis(2-Chloroethoxy)methane	ND	670	
2,4-Dichlorophenol	ND	670	
1,2,4-Trichlorobenzene	ND	670	
Naphthalene	ND	670	
4-Chloroaniline	ND	1,300	
Hexachlorobutadiene	ND	670	
4-Chloro-3-methylphenol	ND	1,300	
2-Methylnaphthalene	ND	670	
Hexachlorocyclopentadiene	ND	670	
2,4,6-Trichlorophenol	ND	670	
2,4,5-Trichlorophenol	ND	670	
2-Chloronaphthalene	ND	670	
2-Nitroaniline	ND	3,300	
Dimethyl phthalate	ND	670	
Acenaphthylene	ND	670	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental Engineering
Lab No: 27267qc3
Units: ug/kg
Date: October 12, 1992
Blank No: S6287

METHOD BLANK

Compound	Blank Value	PQL	Flags
3-Nitroaniline	ND	3,300	
Acenaphthene	ND	670	
2,4-Dinitrophenol	ND	3,300	
4-Nitrophenol	ND	3,300	
Dibenzofuran	ND	670	
2,4-Dinitrotoluene	ND	670	
2,4-Dinitrotoluene	ND	670	
2,6-Dinitrotoluene	ND	670	
Diethylphthalate	ND	670	
4-Chlorophenyl phenyl ether	ND	670	
Fluorene	ND	670	
4-Nitroaniline	ND	3,300	
4,6-Dinitro-2-methylphenol	ND	3,300	
N-Nitrosodiphenylamine	ND	670	
4-Bromophenyl phenyl ether	ND	670	
Hexachlorobenzene	ND	670	
Pentachlorophenol	ND	3,300	
Phenanthrene	ND	670	
Anthracene	ND	670	
Di-n-butylphthalate	220	670	J
Fluoranthene	ND	670	
Pyrene	ND	670	
Butyl benzyl phthalate	ND	670	
3,3'-Dichlorobenzidine	ND	1,300	
Benzo(a)anthracene	ND	670	
bis(2-ethylhexyl)phthalate	ND	670	
Chrysene	ND	670	
Di-n-octyl phthalate	ND	670	
Benzo(b)fluoranthene	ND	670	
Benzo(k)fluoranthene	ND	670	
Benzo(a)pyrene	ND	670	
Indeno(1,2,3-cd)pyrene	ND	670	
Dibenz(a,h)anthracene	ND	670	
Benzo(g,h,i)perylene	ND	670	

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental Engineering
Lab No: 27267qc3
Units: ug/kg
Date: October 12, 1992
Blank No: S6287

ND = Not Detected.

PQL = Practical Quantitation Limit - These are the Quantitation Limits for this sample. This number is based on sample size, matrix and dilution required.

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	86	35 - 114	23 - 120
2-Fluorobiphenyl	85	43 - 116	30 - 115
p-Terphenyl-d14	95	33 - 141	18 - 137
Phenol-d6	73	10 - 94	24 - 113
2-Fluorophenol	88	21 - 100	25 - 121
2,4,6-TBP	93	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental Engineering
Lab No: 27267msd
Date: October 12, 1992

SEMI-VOLATILE ORGANICS

MS/MSD No. 27267-1

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	Flags
1,2,4-Trichlorobenzene	3,500	ND	ND	0.0	ND	0.0	0.0	X5
Acenaphthene	3,500	1,500	5,500	114	6,400	138	19	X5
2,4 Dinitrotoluene	3,500	ND	ND	0.0	ND	0.0	0.0	X5
Pyrene	3,500	ND	7,300	210	5,800	170	21	X5
N-nitrosodi-n-Propylamine	3,500	ND	ND	0.0	ND	0.0	0.0	X5
1,4-Dichlorobenzene	3,500	ND	ND	0.0	ND	0.0	0.0	X5
Pentachlorophenol	3,500	ND	ND	0.0	ND	0.0	0.0	X5
Phenol	3,500	ND	ND	0.0	ND	0.0	0.0	X5
2-Chlorophenol	3,500	ND	ND	0.0	ND	0.0	0.0	X5
4-Chloro-3-Methylphenol	3,500	ND	ND	0.0	ND	0.0	0.0	X5
4-Nitrophenol	3,500	ND	ND	0.0	ND	0.0	0.0	X5

RPD = Relative Percent Difference
% REC = Percent Recovery

*QC Limits:	RPD	% RECOVERY
1,2,4-Trichlorobenzene	23	38-107
Acenaphthene	19	31-137
2,4 Dinitrotoluene	47	28-89
Pyrene	36	35-142
N-nitrosodi-n-Propylamine	38	41-126
1,4-Dichlorobenzene	27	28-104
Pentachlorophenol	47	17-109
Phenol	35	26-90
2-Chlorophenol	50	25-102
4-Chloro-3-Methylphenol	33	26-103
4-Nitrophenol	50	11-114

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B: This analyte was also detected in the associated method blank. There is a possibility of blank contamination.

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY